

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
8 July 2004 (08.07.2004)

PCT

(10) International Publication Number
WO 2004/057205 A3

(51) International Patent Classification⁷: **F16D 65/00**

Richard [GB/IT]; Via Cardonata, 32, I-10060 San Secondo Di Pinerolo (IT). **BERUTTI, Ettore** [IT/IT]; Corso Traiano, 60, I-10135 Torino (IT).

(21) International Application Number:
PCT/EP2003/014704

(74) Agents: **FIORAVANTI, Corrado** et al.; Jacobacci & Partners S.p.A., Corso Regio Parco, 27, I-10152 Torino (IT).

(22) International Filing Date:
22 December 2003 (22.12.2003)

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
TO2002 A 001104
20 December 2002 (20.12.2002) IT

(84) Designated States (*regional*): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

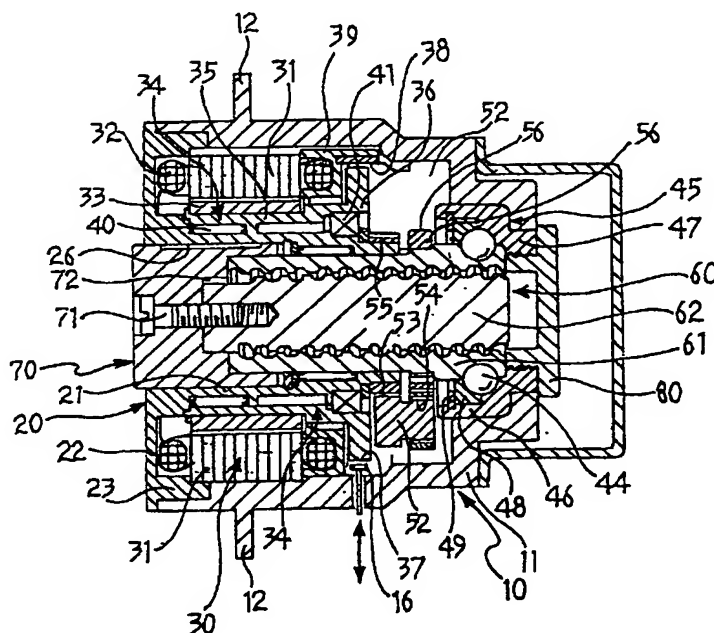
(71) Applicant (*for all designated States except US*): **AK-TIEBOLAGET SKF** [SE/SE]; S-415 50 Goeteborg (SE).

(72) Inventors; and

(75) Inventors/Applicants (*for US only*): **CORBETT,**

[Continued on next page]

(54) Title: AN ELECTRO-MECHANICAL SCREW ACTUATOR ASSEMBLY



(57) Abstract: The assembly comprises an electric motor (30) with a stator (31) and a rotor (34), a screw mechanism (60) including a rotatable nut (61) and a central screw (62) translatable along a given axis (x), and a planetary gear reduction system (50) disposed between the rotor (34) and the screw mechanism (60). The rotor (34) serves as a carrier for the satellite gears (52) of the reduction system (50).

WO 2004/057205 A3

**Declarations under Rule 4.17:**

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations*

Published:

- *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:

12 August 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 F16D65/14

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F16D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 325 180 B1 (HAAS ROLAND ET AL) 4 December 2001 (2001-12-04)	1,2
A	column 4, line 63 - column 5, line 16; figure 2	6,11
A	US 5 829 557 A (HALASY-WIMMER GEORG ET AL) 3 November 1998 (1998-11-03) column 5, line 29 - column 6, line 14; figure 4	1,11
A	WO 00/45064 A (FUCKS THOMAS WILHELM ; ZWARTS JACOBUS (NL); KAPAAN HENDRIKUS JAN (NL);) 3 August 2000 (2000-08-03) page 3, line 31 - page 4, line 16; figure -/-	1,11

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

18 June 2004

Date of mailing of the international search report

28/06/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Van Koten, G

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01/70552 A (BOSCH GMBH ROBERT ; HILZINGER JUERGEN (DE); KASTINGER GUENTER (DE); BL) 27 September 2001 (2001-09-27) page 9, line 10 - page 10, line 3; figure 1 -----	1,11

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/14704

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6325180	B1	04-12-2001	NL 1006543 C2	12-01-1999
			AU 8132598 A	08-02-1999
			CN 1143064 C	24-03-2004
			DE 69809052 D1	05-12-2002
			DE 69809052 T2	12-06-2003
			EP 0993564 A1	19-04-2000
			JP 2001509574 T	24-07-2001
			WO 9902883 A1	21-01-1999
US 5829557	A	03-11-1998	DE 19511287 A1	25-01-1996
			CZ 9600594 A3	17-07-1996
			DE 59507612 D1	17-02-2000
			WO 9603301 A1	08-02-1996
			EP 0728089 A1	28-08-1996
			HU 75406 A2	28-05-1997
			PL 313522 A1	08-07-1996
			SK 29496 A3	01-10-1996
WO 0045064	A	03-08-2000	JP 10504876 T	12-05-1998
			NL 1011142 C2	31-07-2000
			AU 2467600 A	18-08-2000
			CN 1339092 T	06-03-2002
			DE 60003887 D1	21-08-2003
			DE 60003887 T2	22-01-2004
			EP 1147328 A1	24-10-2001
			JP 2002535581 T	22-10-2002
WO 0170552	A	27-09-2001	WO 0045064 A1	03-08-2000
			DE 10014226 A1	27-09-2001
			WO 0170552 A1	27-09-2001
			EP 1268250 A1	02-01-2003
			JP 2004502097 T	22-01-2004
			US 2004036370 A1	26-02-2004